

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Review of the Spectrum Sharing Plan)	
Among Non-Geostationary Satellite Orbit)	IB Docket No. 02-364
Mobile Satellite Service Systems in the)	
1.6/2.4 GHz Bands)	
)	
Amendment of Part 2 of the Commission's)	
Rules to Allocate Spectrum Below 3 GHz)	
for Mobile and Fixed Services to Support)	ET Docket No. 00-258
the Introduction of New Advanced)	
Wireless Services, including Third)	
Generation Wireless Systems)	
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**PETITION FOR RECONSIDERATION
OF GLOBALSTAR LLC**

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SUMMARY

Globalstar LLC is filing this Petition for Reconsideration to request implementation of changes in the rules adopted for L-band and S-band sharing for Big LEO Mobile-Satellite Service (“MSS”) systems. The proposed changes will ensure that Globalstar can access L-band and S-band spectrum in the manner contemplated by the Commission in the Report and Order in this docket.

L-Band. The Commission has decided that the CDMA and TDMA Big LEO MSS systems must share access to the 1618.25-1621.35 MHz band. Currently, Iridium, the TDMA system, has exclusive access to the 1621.35-1626.5 MHz band. The record in this proceeding demonstrated that Iridium does not need access to additional spectrum to serve U.S. subscribers now and into the future.

Globalstar, the only operational CDMA system, has access to the 1610-1616 MHz band which is encumbered by inter-service sharing rules for the protection of Global Navigation Satellite Systems and Radio-Astronomy Service sites. Globalstar also has access to the 1616-1621.35 MHz band, but, as a result of the Report and Order, must share 3.1 MHz of this spectrum with Iridium.

The Commission acknowledges that Globalstar and Iridium must coordinate usage of the 1618.25-1621.35 MHz band, but did not set any ground rules for the coordination. For example, because Iridium is not fully using the 5.15 MHz of spectrum to which it has exclusive access, it could attempt to load its users into the shared 3.1 MHz of spectrum reserving its exclusive access spectrum. Such a scenario does not promote what the Commission deemed “spectrum efficiency,” that

is, increasing the number of systems that can use the spectrum. Granting Iridium access to additional spectrum at this time was premature and may require unnecessary coordination between Globalstar and Iridium.

Accordingly, the Commission must require Iridium to demonstrate actual need for spectrum before gaining access to any portion of the shared 3.1 MHz on a channel-by-channel basis. Iridium should first have to demonstrate a need for Channel 9 of the CDMA segment (1619.955-1621.35 MHz) before gaining access to any portion of Channel 8 (1618.725-1619.955 MHz). The Commission should also grant Globalstar access to the 1621.35-1626.5 MHz band in a channel-by-channel (Channels 10-13) amount equal to whatever channels Iridium attempts to coordinate for use in the 1618.25-1621.35 MHz band. If these measures are not acceptable to the Commission and Iridium, then the Commission should restore the L-band plan to the *status quo*, unless and until Iridium has demonstrated an actual need for additional spectrum.

Moreover, if the Commission retains the current L-band sharing requirement, then it should raise the lower boundary of the shared spectrum to 1618.725 MHz. This action will take into account Globalstar's use of 1.23 MHz channels, and will give Globalstar access to two unencumbered L-band channels.

S-Band. The Commission reallocated that 2495-2500 MHz band to fixed and mobile terrestrial services and made the MSS downlink allocation secondary to Broadband Radio Service ("BRS") stations. Yet, the Commission stated that it

desired Globalstar to use this spectrum in rural areas while the new BRS licensees operate primarily in urban areas.

Currently, the MDS-1 licensees that will be transferred to the 2496-2502 MHz band are licensed nationwide. And, the Commission is permitting BRS base stations to operate at up to 2000 watts peak EIRP and user terminals at up to 2 watts EIRP. These power levels would severely interfere with MSS downlink operations and make it impossible for MSS to operate in the band as the Commission envisioned.

In order to make MSS operations feasible in the 2495-2500 MHz, the Commission should (1) limit BRS operations in this band to the top 35 MSAs; (2) limit BRS base station power to an EIRP of 600 watts; and (3) limit out-of-band emissions from BRS users, for 99% of the time, to an aggregate not to exceed -209 dBW/Hz outside the top 35 MSAs in the frequency range 2483.5-2500 MHz.

47 U.S.C. § 316. In the Report and Order, the Commission expanded the rights of Iridium to use the 1618.25-1621.35 MHz band and placed new users into the 2495-2500 MHz band. Iridium and the BRS stations will cause harmful interference to co-frequency operations of Globalstar. The Commission thus has restricted the rights of Globalstar to operate in its authorized frequencies in L-band and S-band.

In such cases, Section 316 of the Communications Act requires that the Commission provide notice and hearing to Globalstar to consider the impact of the expanded spectrum rights for Iridium and BRS on Globalstar to determine whether

such action serves the public interest. The Commission claims that Section 316 is not implicated by its action, but the plain language of the statute and prior judicial decisions demonstrate that the Commission is not permitted to suppress Globalstar's rights to a Section 316 notice-and-hearing in this context. The Commission apparently did not consider the extent of the interference of the new stations and services operating in the spectrum available to Globalstar. This is exactly the purpose served by following the procedures set forth in Section 316.

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**PETITION FOR RECONSIDERATION
OF GLOBALSTAR LLC**

Pursuant to Section 1.429 of the Commission's Rules (47 C.F.R. § 1.429), Globalstar LLC ("GLLC") petitions for reconsideration of the rules adopted in the Report and Order in IB Docket No. 02-364.¹

GLLC owns and operates the international Mobile-Satellite Service ("MSS") business offered through the Globalstar™ non-geostationary satellite constellation in the 1.6/2.4 GHz bands.² Currently, Globalstar service is available in over 120

¹ See Report and Order, Fourth Report and Order and Further Notice of Proposed Rulemaking, FCC 04-134 (released July 16, 2004), published at 69 Fed. Reg. 48157 (Aug. 9, 2004) ("L-Band Order").

² See Loral/Qualcomm Partnership, L.P., 10 FCC Rcd 2333 (Int'l Bur. 1995) (1.6/2.4 GHz user links); L/Q Licensee, Inc., 11 FCC Rcd 16410 (Int'l Bur. 1996) (5/7 (continued...))

countries globally. Globalstar offers a variety of voice, fax and data services, and, with over 120,000 subscribers, is the most widely used MSS network in the world.

The number of Globalstar's U.S. subscribers has continued to grow dramatically in 2004 as it has for the prior three years, with increases of approximately 10,000 new subscribers in each of the last two four quarter periods of July through June. The increase in Globalstar subscribers in the U.S. and globally demonstrates the efforts of Globalstar to find and serve niche MSS markets and the public's recognition of the variety of uses for MSS services and of the ability of MSS to provide telecommunications services in underserved and otherwise unserved areas. The growth of the Globalstar business and the availability of Globalstar services depends upon the system having access to sufficient spectrum to offer this robust and competitive service.

Background

In the L-Band Order, the Commission decided to modify the existing Big LEO MSS band plan, and ordered that the operational Big LEO MSS systems, Globalstar using CDMA and Iridium using TDMA access technology, should share use of the 1618.25-1621.35 MHz band for both systems' uplinks and Iridium's secondary downlinks. The Commission reasoned that the sharing requirement would promote "spectral efficiency."

(...continued)

GHz feeder links). The Globalstar satellite constellation license was assigned to Globalstar LLC by L/Q Licensee, Inc. See Public Notice, DA 04-628 (released Mar. 8, 2004).

The Commission also reallocated the 2495-2500 MHz band to fixed and mobile terrestrial services on a primary basis, and made the MSS downlink allocation in this segment secondary. The Commission, however, anticipated that Globalstar will still use these frequencies for CDMA downlinks in rural areas, while fixed and mobile stations operate primarily in urban areas.

For the reasons set forth below, the Commission should reconsider the L-Band Order, and adopt the rule modifications proposed herein to fulfill its expectations that Globalstar will continue to have meaningful access to the CDMA uplink frequencies from 1618.25-1621.35 MHz and the CDMA downlink frequencies at 2495-2500 MHz.

I. THE COMMISSION MUST MODIFY THE L-BAND SHARING RULE TO PROTECT GLOBALSTAR AND PROMOTE SPECTRAL EFFICIENCY.

The Commission initiated this rulemaking to reconsider the Big LEO spectrum sharing plan based on a petition by Iridium Satellite LLC claiming that Iridium needed access to additional spectrum to meet subscriber demand.³ In its comments and numerous *ex parte* presentations filed on the NPRM, Globalstar demonstrated that Iridium's existing spectrum assignment at 1621.35-1626.5 MHz was more than adequate to serve its current U.S. subscribers *and* to satisfy its

³ See Iridium Satellite LLC, Petition for Rulemaking, IB Dkt. No. 01-185 (filed July 26, 2002).

likely subscriber growth well into the future.⁴ Iridium presented no affirmative factual case in support of its position or any evidence that rebutted Globalstar's presentation on this issue.

In its review of the record, the Commission essentially agreed with Globalstar, finding that Iridium's petition for assignment of additional spectrum was based on "what appears to be a sporadic and geographically-based need." (L-Band Order, ¶ 47.)

Despite that finding, the Commission decided to grant Iridium shared access to an additional 3.1 MHz at 1618.25-1621.35 MHz. The Commission concluded that "sharing this spectrum should promote spectral efficiency by increasing the number of MSS licensees that will use this spectrum, particularly at a time when demand for spectrum has increased." (L-Band Order, ¶ 45.) Thus, the Commission rationalized the change in the Big LEO band plan on a vague policy to promote spectral efficiency rather than a demonstrated need for additional spectrum.

A. The Record in this Docket and the Reasoning in the L-Band Order Do Not Support the Rules Adopted.

The Commission's decision to require shared access to the 1618.25-1621.35 MHz band is not supported by the record. For example, Globalstar's March 19,

⁴ See Joint Reply Comments of L/Q Licensee, Inc., Globalstar, L.P., and Globalstar USA L.L.C. (filed July 25, 2003); Globalstar, L.P., Ex Parte Presentation (filed Mar. 19, 2004).

2004, analysis of what little information Iridium did provide (from December 19, 2003) confirmed the following points:⁵

- There are several features of the Iridium system design and network that limit Iridium's capacity much more significantly than availability of L-band spectrum.
- Measurements of actual usage on the Iridium system indicate that Iridium is currently using less than 5% of its available spectrum in the Continental United States.
- Grant of temporary access for Iridium to additional spectrum in the Middle East region alone did not result in Iridium's claimed improvement in call acquisition failure rate in that region after April 2003.
- Given the Iridium system design and projected subscriber growth, Iridium Satellite should be able to serve users in the Continental United States for over 20 years into the future with its currently available 5.15 MHz in L-band.
- The availability of more spectrum (CDMA Channels 8 and 9) in the Middle East did not increase Iridium's capacity, based on its own data.⁶

Iridium did not rebut Globalstar's analysis. Consequently, under well-established statutory interpretation and case law, the record in this docket cannot support any change to the existing Big LEO spectrum plan.

The Commission's "spectral efficiency" rationale is itself flawed because it is based on a misperception of the manner in which Globalstar and Iridium would use the "shared" spectrum. While Globalstar and Iridium certainly can *coordinate*

⁵ Globalstar, L.P., Ex Parte Presentation (Mar. 19, 2004).

⁶ See Joint Reply Comments of L/Q Licensee, Inc., Globalstar, L.P., and Globalstar USA L.L.C., Att. A, Technical Analysis (filed July 25, 2003).

usage of spectrum, the two systems cannot *share* the spectrum co-frequency, co-coverage in the same way that, for example, two systems using Code Division Multiple Access technology can share frequencies. At some point, access by one system to the “jointly used” spectrum requires the other to cede access. (See Tech. App., § 2.) This is not “sharing” in any sense of the concept.

Globalstar demonstrated in its submissions that it needs access to all nine L-band CDMA channels in order to meet current and immediately future service needs. Nevertheless, no restrictions were placed on Iridium’s usage of the 1618.25-1621.35 MHz portion of the band. Iridium could theoretically “require” access to all 3.1 MHz even though it has not filled up its exclusive spectrum at 1621.35-1626.5 MHz. In other words, Iridium could load all its traffic in the 1618.25-1621.35 MHz band and leave its 1621.35-1626.5 MHz band free of transmissions. The Commission would have, in effect, created for Iridium a simple and difficult-to-detect way of “gaming the system” to anticompetitive ends. This is the antithesis of the “spectral efficiency” that the Commission hopes to achieve.

B. The L-Band Sharing Rule Must Be Modified.

The L-Band Order purports to grant Iridium access to additional spectrum while protecting Globalstar’s access to the same amount of spectrum that it currently has for operations. In this, the Commission fails. If the Commission does not reverse its ill-advised decision, then at a minimum it must modify the plan to ensure that the goals of the order are accomplished.

The Commission must require Iridium to demonstrate actual need for spectrum before gaining access to any portion of the shared 3.1 MHz. In conjunction with this requirement, the Commission should make spectrum available to Iridium only on a channel-by-channel basis. Iridium should first have to demonstrate a need for Channel 9 of the CDMA segment (1619.955-1621.35 MHz) before gaining access to any portion of Channel 8 (1618.725-1619.955 MHz).⁷ Globalstar proposed a “sharing” plan based on the principle of mutual demonstrated need for spectrum to Iridium in June 2003. Iridium summarily rejected the plan and declined to offer a counterproposal.

At the same time, the Commission should grant Globalstar access to Iridium’s 1621.35-1626.5 MHz band in a channel-by-channel (Channels 10-13) amount equal to whatever channels Iridium attempts to coordinate for use in the 1618.25-1621.35 MHz band. If use of spectrum by more than one MSS licensee promotes “spectral efficiency,” then the Commission should want to encourage that policy throughout the L-band. By requiring access to reciprocal spectrum channels in each other’s previously exclusive band, the Commission would provide a balance that would discourage overuse of coordination for anti-competitive purposes. Moreover, since Globalstar has demonstrated that Iridium is not fully using its

⁷ Alternatively, the Commission could designate Globalstar as the “incumbent” in the 1618.25-1621.35 MHz band (see ¶ 53), and require Iridium to operate on a secondary basis to Globalstar transmissions. In essence, such designation would require Iridium to use only those frequencies not in use by Globalstar in a certain area.

spectrum in the United States, granting Globalstar access to the 1621.35-1626.5 MHz band would promote “spectral efficiency” by allowing another MSS licensee to use this spectrum.

If a balanced approach such as that suggested here is not adopted by the Commission, then the Commission should restore the L-band plan to the 1994 *status quo ante*, unless and until Iridium has demonstrated an actual need for additional spectrum. Granting Iridium access to additional spectrum at this time was clearly premature, requires unnecessary coordination between Globalstar and Iridium, and encourages anti-competitive conduct.

II. IF THE COMMISSION IS INTENT UPON CHANGING THE SPECTRUM ASSIGNMENTS, THEN THE BOUNDARY FOR SHARED SPECTRUM MUST START AT 1618.725 MHZ RATHER THAN 1618.25 MHZ.

The Commission decided that the CDMA and TDMA Big LEO MSS systems should share the 3.1 MHz of spectrum between 1618.25 MHz and 1621.35 MHz. (L-Band Order, ¶ 48.) The Commission gave two reasons for selecting 3.1 MHz. On the one hand, it acknowledged the inter-service coordination requirements imposed on CDMA systems operating at 1610-1616 MHz, and so provided some unencumbered CDMA spectrum above 1616 MHz. On the other hand, it noted that 3.1 MHz was historically consistent with proposals from the Big LEO Rules Order, adopted in 1994.⁸

⁸ See Amendment of the Commission’s Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz
(continued...)

Globalstar took the position in this proceeding, and maintains, that any future “sharing” must be limited to the 3.1 MHz from 1618.25 to 1621.35 MHz. However, there is a compelling reason to limit the shared spectrum to the segment 1618.725-1621.35 MHz, a difference of less than 0.5 MHz.

As the Commission is aware, the Globalstar system operates in channels of 1.23 MHz bandwidth. Indeed, all the authorized CDMA MSS systems had planned to use this channel bandwidth, or a multiple thereof, in order to facilitate coordination of shared spectrum.

The upper boundary of Channel 7 of the CDMA L-band lies at 1618.725 MHz. Accordingly, by raising the lower boundary of the shared spectrum band, the Commission ensures Globalstar’s access to two full channels above 1616 MHz (Channels 6 and 7). Moving the boundary by 0.475 MHz will thus improve the ability of the CDMA system to use its available frequencies without coordinating with another service or MSS system. Because Iridium operates with TDMA channel bandwidths of approximately 41.67 kHz, there will be no substantial or material impairment in its ability to access additional spectrum through reduction of 0.475 MHz.

Accordingly, if the Commission retains the requirement for the CDMA and TDMA systems to coordinate spectrum usage between 1618 MHz and 1621.35 MHz,

(...continued)

Frequency Bands, 9 FCC Rcd 5934 (1994) (“Big LEO Rules Order”), modified on recon., 11 FCC Rcd 12861 (1996).

the Commission must raise the lower boundary of the coordination zone to 1618.725 MHz.

III. THE COMMISSION MUST IMPOSE OPERATIONAL LIMITS ON FIXED AND MOBILE SERVICES IN 2495-2500 MHZ BAND.

The Commission allocated the 2495-2500 MHz band for fixed and mobile (non-aeronautical) Broadband Radio Services (“BRS”) on a primary basis to be shared with MSS downlinks operating on a secondary basis to BRS. (L-Band Order, ¶ 69.) The Commission decided that such co-frequency sharing was technically feasible because:

BRS operations are likely to be in urban, suburban, and somewhat developed rural areas while the greatest demand for CDMA MSS operations is likely to be in very rural and undeveloped areas with little or no existing communications infrastructure. An MSS user in an urban setting may still be able to access the CDMA MSS system through ATC operations even if the top 4 megahertz of the CDMA MSS downlink were to be unavailable. . . . Additionally, to further protect the CDMA MSS downlink operations in rural areas at the 2495-2500 MHz band, we restrict the use of mobile services by making the allocation for “mobile except aeronautical,” thereby eliminating the possible use of airborne mobile transmitters in this band. Further, the BRS will be restricted to using low power operations in the 2496-2500 MHz band. With these allocation changes the CDMA MSS downlink in the 2495-2500 MHz band should remain viable.⁹

⁹ L-Band Order, ¶ 72 (footnotes omitted). The Commission stated that it would adopt separate out-of-band emissions limits on BRS operations in order to protect MSS downlink operations in the 2483.5-2495 MHz band.

It is clear from this explanation that the Commission based its decision to reallocate the 2495-2500 MHz band on the expectations that (a) CDMA MSS operations would be viable in rural and undeveloped areas of the United States and (b) CDMA MSS operations would be available in urban, suburban and somewhat developed areas as well through ATC or MSS.¹⁰

Unfortunately, the Commission adopted no restrictions on BRS operations that would allow either of those expectations of future MSS operations in the 2495-2500 MHz band to be realized.

In the BRS/EBS Order, the Commission decided to transition existing MDS licensees in the 2150-2156 MHz band (MDS-1) to the 2496-2502 MHz band.¹¹ MDS-1 is already licensed *nationwide*, either through pre-auction site-based licensing, or through geographic area licensing in Auction No. 6.¹² Thus, the assumption that BRS operations in the 2496-2502 MHz band are more likely to occur in urban areas is flawed, because the current MDS-1 licensees that will move into that band are already licensed nationwide.

¹⁰ Contrary to the Commission's calculations in paragraph 66, Globalstar still has access to 11.35 MHz of spectrum in L-band, and so, requires access up to 16.5 MHz (11.35 MHz times 4) of spectrum in S-band.

¹¹ Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, FCC 04-135, ¶ 37 (released July 29, 2004); 47 C.F.R. § 27.5; see also L-Band Order, ¶ 71.

¹² See Amendment of Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service, 10 FCC Rcd 9589 (1995).

Moreover, the Commission has adopted EIRP limits for BRS/EBS operations in the Lower Band Segment, which includes the 2496-2500 MHz band, of 2000 watts EIRP for base station operations and 2 watts EIRP for mobile terminals.¹³ As explained in the Technical Appendix (§ 1), operations at these power levels will wipe out MSS downlink operations, either satellite or ATC, for a radius of 30 kilometers.

Accordingly, if the Commission actually desires to make the 2495-2500 MHz band available for MSS operations, then, as explained in the Technical Appendix, it must adopt the following restrictions on BRS operations in the band:

First, limit BRS operations to the top 35 MSAs;

Second, limit BRS base station power to an EIRP of 600 watts;

Third, limit out-of-band emissions from BRS users, for 99% of the time, to an aggregate not to exceed -209 dBW/Hz at any point outside the boundaries of the 35 MSAs in the frequency range 2483.5-2500 MHz.

Imposing these requirements on BRS stations will make it feasible for Globalstar to use the 2495-2500 MHz band in rural areas while BRS uses the same band in urban areas. Without such restrictions, the Commission has not only reallocated the band to BRS but also adopted a *de facto* suppression of the MSS allocation.

¹³ 47 C.F.R. § 27.50(h).

IV. THE COMMISSION MUST GRANT GLOBALSTAR A HEARING PURSUANT TO § 316 OF THE COMMUNICATIONS ACT.

The Commission has previously acknowledged for Big LEO systems that any modification to existing rights to operate in assigned spectrum must comply with Section 316 of the Communications Act of 1934, as amended.¹⁴ Moreover, the Commission stated in the L-Band Order (¶ 88) that the modifications to expand Iridium's spectrum rights implicated Section 316 of the Act. The modifications to Globalstar operations also fall within Section 316 and require notice-and-hearing procedures.

The Commission finds (L-Band Order, ¶ 85) that use of its rulemaking authority in this proceeding exempts the modifications to Globalstar operations from the protections of Section 316. However, the Commission "cannot, merely by invoking its rulemaking authority, avoid the adjudicatory procedures required for granting and modifying *individual* licenses."¹⁵ As discussed above, the changes to CDMA Big LEO operations result in substantial restrictions on Globalstar's current operations and on its access to the L-band and S-band frequencies specified in its licenses. Therefore, even though these restrictions may be imposed by "rule," they are "in substance and effect individual in impact and condemnatory in purpose"¹⁶

¹⁴ 47 U.S.C. § 316; see Iridium Constellation, LLC and Iridium US LP, Order to Show Cause, 18 FCC Rcd 10441, ¶ 1 (Int'l Bur. 2003).

¹⁵ Committee for Effective Cellular Rules v. FCC, 53 F.3d 1309, 1319 (D.C. Cir. 1995).

¹⁶ California Citizens Band Assoc. v. FCC, 375 F.2d 43, 51-52 (9th Cir. 1967).

for just one licensee — Globalstar. In any event, it is nowhere explained why mere rule changes under the Commission’s theory would trigger Section 316 for one licensee (Iridium) but not another similarly situated (Globalstar).

In both L-band and S-band, the Commission has expanded the spectrum rights of other licensees, granting access to more Big LEO MSS L-band spectrum to Iridium and granting new access to Big LEO MSS S-band spectrum to MDS-1 licensees. Despite the Commission’s explicit intention that Globalstar retain full rights to use this spectrum, Globalstar’s operations are directly modified and limited by the rights granted to Iridium and MDS-1 licensees, in other words, exactly the situation contemplated by the protections in Section 316. As demonstrated above, the “sharing” imposed upon Globalstar with Iridium and BRS is not sharing at all. Rather, in each case, granting access to the other system or service suppresses Globalstar’s access to the spectrum, even though the frequencies have not been eliminated from its license. The policy justification for this action, “spectral efficiency,” is no justification at all, because granting two radio stations access to the same spectrum, when they cannot operate co-frequency, co-coverage, does not promote efficiency, *it promotes interference*.¹⁷ The Commission simply cannot preclude consideration of the effect of a “rule” on an individual station, but must give such station the opportunity to respond to the impact of the Commission’s

¹⁷ See Spectrum Policy Task Force, Report, at 21 (Nov. 2002) (“Spectrum efficiency occurs when the maximum amount of information is transmitted within the least amount of spectrum”).

proposed actions with respect to grant of authority to other stations with whom the first station's operations would be mutually exclusive.

Relying on P&R Temmer v. FCC, 743 F.2d 918 (D.C. Cir. 1984), the Commission claims that, even if its actions result in a modification of Globalstar's license, no "unconditional rights" of Globalstar were altered by its decisions, and so no hearing under Section 316 procedure was required. However, this is not a case where Globalstar failed to fulfill a condition precedent on its license to retain access to the L-band and S-band frequencies,¹⁸ nor is it a case in which an existing rule conditioned certain operations upon order of the Commission.¹⁹ *Globalstar is today using spectrum that it will be precluded from using, in a very real sense, in the future.*

The attached Technical Appendix shows that Globalstar and BRS stations cannot operate co-frequency, co-coverage, and Globalstar and Iridium cannot operate co-frequency, co-coverage. The Commission acknowledged in the Big LEO Rules Order that CDMA system *can* operate co-frequency, co-coverage, and for that reason it could grant all the pending CDMA LEO applications rather than requiring

¹⁸ See P&R Temmer v. FCC, 743 F.2d at 927-28 (holding that Section 316 is not triggered by superseding 20-channel license with 5-channel license when licensee failed to meet certain established loading standards to retain access to 20-channels).

¹⁹ See Music Broadcasting Co. v. FCC, 213 F.3d 339 (D.C. Cir. 1954) (holding Section 316 not implicated when FCC ordered broadcast station to cease pre-sunrise operations in accordance with rule making such operations conditioned on not receiving such FCC mandate).

a comparative hearing.²⁰ While Globalstar did not have access to “unshared” CDMA spectrum under the 1994 band plan, it did have unfettered access to 11.35 MHz and 16.5 MHz of spectrum. The proximity and number of BRS stations exclude Globalstar from use of the 2495-2500 MHz band, and the capacity demands of Iridium, however unsubstantiated, may exclude Globalstar from use of the 1618.25-1621.35 MHz band. Therefore, the unconditional rights of Globalstar to use the frequencies as contemplated under its 1995 license have been significantly and directly altered.

The Commission’s own statements illustrate Globalstar’s altered operations. As Globalstar explained in its comments, the Globalstar system was designed to operate in the 11.35 MHz of L-band and 16.5 MHz of S-band spectrum (a 1:1.4 ratio) to maximize capacity and efficiency. In the L-Band Order, the Commission recognized this maximum usage was eliminated by using the formula for Globalstar L-band/S-band requirements to reduce the amount of S-band spectrum (to 11.5 MHz) available to the system (8.25 MHz L-band spectrum times 1.4 ratio). (L-Band Order, ¶ 66.) In other words, the Commission only considered that Globalstar would have 11.5 MHz of S-band spectrum to pair with 8.25 MHz of L-band spectrum.

²⁰ See Big LEO Rules Order, 9 FCC Rcd at 5942 n.18 (“The spreading and the variation in the code [of Code Division Multiple Access technology systems] permit a number of users to operate on the same frequency simultaneously without causing harmful interference”).

At its core, Section 316 provides a mechanism for a licensee to explain to the Commission how the extension of spectrum right to third parties will impact an existing licensee through interference to existing operations with the burden of proof on the Commission to justify its proposed changes. Globalstar has not had that opportunity, and, indeed, the Commission's statement about "sharing" with Iridium and sharing with BRS are inaccurate. A Section 316 hearing would, therefore, serve the purpose for which it was designed.

If, on the other hand, the Commission is correct that Globalstar merely holds a conditional license that allows the Commission to change its parameters at will, then the changes invoked here violate the due process rights of Globalstar. The Commission never established a standard for limiting access by CDMA MSS systems to the Big LEO spectrum in 1994, such as loading requirements or spectral efficiency. Globalstar met all regulatory requirements for use of the entire CDMA spectrum assignment, and has developed equipment and services in reliance on the availability of the CDMA spectrum. Therefore, any modification to the Big LEO band plan which takes spectrum away from Globalstar based on some newly announced efficiency standard is unfairly penalizing Globalstar for not meeting a standard which the Commission has not even articulated.

It is well settled that "[t]raditional concepts of due process incorporated into administrative law preclude an agency from penalizing a private party for violating

a rule without first providing adequate notice of the substance of the rule.”²¹ The Commission never suggested in 1994 that it would take spectrum away from Big LEO systems for loading or efficiency requirements, and, therefore, it cannot do so now except on a prospective basis based on some clearly articulated policy that Globalstar has a realistic opportunity to meet.

²¹ Satellite Broadcasting Co. v. FCC, 824 F.2d 1, 3 (D.C. Cir. 1987); see also, e.g., Eastern Carolina Broadcasting Co. v. FCC, 762 F.2d 95, 101 (D.C. Cir. 1985); Trinity Broadcasting of Florida, Inc. v. FCC, 211 F.3d 618, 632 (D.C. Cir. 2000).

V. CONCLUSION

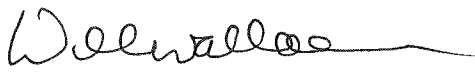
For the reasons set forth above, the Commission must reconsider the usefulness of CDMA-TDMA sharing in the Big LEO L-band and, if spectrum-sharing is retained, how to improve coordination of the spectrum. At the least, the Commission must move the lower boundary of the shared L-band to 1618.725 MHz. The Commission must also adopt restrictions on BRS operations in the 2496-2602 MHz band to make feasible the use of the 2495-2500 MHz band for MSS CDMA downlinks. Finally, if the Commission retains the grant of new spectrum rights to Iridium and BRS licensees, it must conduct a hearing pursuant to Section 316 for Globalstar as the adversely-affected licensee.

Respectfully submitted,

GLOBALSTAR LLC

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Date: September 8, 2004

TECHNICAL APPENDIX

GLOBALSTAR LLC

TECHNICAL APPENDIX

PETITION FOR RECONSIDERATION (IB Dkt. No. 02-364)

1. Sharing between MSS and BRS at S-Band

The Broadband Radio Service ("BRS") stations that are now permitted in the 2495-2500 MHz band are to be relocated from MDS Channel 1, currently at 2150-2156 MHz. Axcera is an example of such a user for its Axyty 3G Broadband Technology, which uses the channels for services based on the 3GPP TDD TD-CDMA specification, with 3.84 Mcps operation in 5 MHz bands. Axcera states that "[t]he system gain (link budget) is typically higher than 2G cellular systems allowing cells to be larger than that of typical cellular/PCS systems, or alternatively similar size with greater building penetration probability."¹

On page 34 of the Report and Order in IB Dkt. No. 02-364,² the FCC states that it will restrict BRS stations to using low power operations in the 2496-2500 MHz band. It also states, in addition to the 1 megahertz guard band from 2495 to 2496 MHz, that strict out-of-band ("OOB") emissions limits will apply to BRS operations at 2496 MHz and above, and that power limits on BRS stations operating in the 2496-2500 MHz band will protect CDMA MSS downlink operations just below the new band edge at 2495 MHz. Globalstar agrees that these restrictions are necessary, but at the moment they are not sufficient to allow Globalstar to continue providing MSS in the same frequency bands in the same geographic area.

The FCC states that current and future CDMA MSS operations must accept interference from the BRS stations within the 2495-2500 MHz band. However, Globalstar is especially concerned by the specifications of operators like Axcera, which states that it intends to use higher power levels and/or larger cell sizes than second-generation systems, with an unspecified number of users per cell. If MSS services must operate with interference from these BRS stations, the FCC must adopt the following restrictions:

¹ http://axyty3g.axcera.com/system_overview.php.

² Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, FCC 04-134 (released July 26, 2004).

- a. There must be a limit on the geographical regions of BRS operation in the 2496-2500 MHz bands.
- b. The allowable power of BRS base stations must be limited to 600 watts EIRP in the 2496-2500 MHz band; and
- c. BRS operators must coordinate with MSS operators and show, by analysis, that the aggregate OOB emissions from BRS users will not (for at least 99% of the time) exceed -209 dBW/Hz at any point outside the top 35 MSAs in the frequency range 2483.5-2500 MHz.

As the link budget in Table 2 below shows, a BRS user terminal would have to operate at 0.18 mw within 1 km of a Globalstar user not to cause interference. No current technology can operate at this low power level (0.18 mw) needed for a user which is within 1 km of any Globalstar user. The only way BRS and MSS can co-exist in this band is for the FCC to restrict the geographical regions in which BRS is authorized in the 2495-2500 MHz band. Globalstar suggests that BRS stations only be allowed to operate in this band in the top 35 major metropolitan areas (MSAs), where, as the FCC notes, MSS does not have a large density of satellite service users.

In calculating interference into Globalstar from BRS stations operating in the 2496-2500 MHz band, the Erceg propagation model is used for transmissions from the user terminal. The model normally used for terrestrial cellular, the Hata model, is useful for base station heights above 30 meters, in the frequency range 500-1500 MHz and in urban areas. But, for base station heights that are typical in fixed wireless applications, and for suburban and wooded areas, the Erceg model is considered more accurate, as discussed in an IEEE contribution IEEE 802.16.3c-01/29, "Channel models for fixed wireless applications" dated 1/22/2001 from Stanford University, and shown in Figure 1 below.

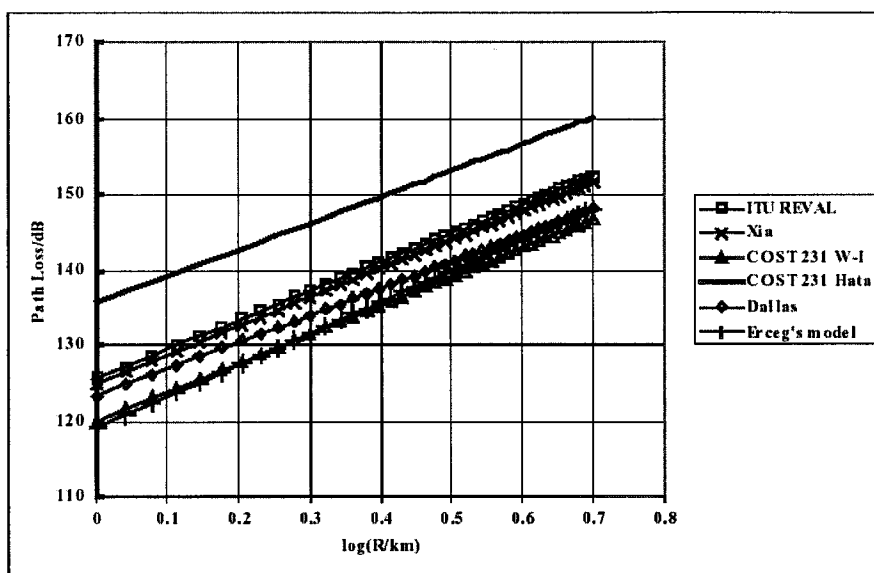


Figure 1. Comparison of suburban path loss models.

The Erceg propagation model is used in Tables 1 (a) and (b) below, illustrating the interference of a BRS base station into Globalstar. The same model is used in the Table 2 below, illustrating the interference of a BRS user terminal in Globalstar. Table 1(a) shows that a BRS base station operating at a 600 watt EIRP will cause a 3% degradation in self-interference plus noise density at a Globalstar receiver operating co-frequency at a distance of 20 km from the base station. The interference dramatically increases as this distance decreases. In Table 1(b), a station with the same EIRP at 10 km distance causes 36% degradation to Globalstar, which is totally unacceptable. A 2000 watt BRS base station causes 3% degradation to a Globalstar user about km away, which means an area that is twice as large as the one affected by a 600 watt base station. Three percent degradation is generally accepted as the maximum allowable degradation due to external interference; accordingly, the FCC should adopt the restrictions stated above for BRS stations.

The link budget in Table 2 shows that the level of interference caused by a single BRS interfering user terminal, operating at 2 watts EIRP, and located 4 km away from a Globalstar user, will reach the allowable 3% degradation level if operating in the same channel as Globalstar. Since BRS will surely have more than one user located within a 4 km

range of a Globalstar user, this will cause unacceptable degradation to Globalstar service unless restrictions are placed on the geographical locations so that BRS operates only in areas where Globalstar is not serving significant numbers of users.

Table 1(a): Interference from BRS base station into Globalstar- case 1

Link budget for BRS base station interfering w. Globalstar

Frequency	2500 MHz
Interferer BW	5 MHz
Transmit EIRP	600 w
Log transmit EIRP	57.7815125 dBm
Path length, R	20 km
log R	1.301029996
Path loss, Erceg model	-167.7044332 dB
Receive signal power	-109.9229207 dBm
User antenna gain	0 dBi
Line loss	-1 dB
Recd. Interference density	-207.9126207 dBw/Hz
Typical self interference density	-193 dBW/Hz
Typical self interference plus thermal noise density	-192.4850306 dBW/Hz
Allowable % degradation due to external interference	3%
Allowable external interf. (for 3% degradation of self-interf.plus noise)	-192.3566583
Total interference and noise density	-192.3623219 dBW/Hz
Actual degradation in self-interf. plus noise	3%

Table 1 (b): Interference from BRS base station into Globalstar- case 2

Link budget for BRS base station interfering w. Globalstar

Frequency	2500 MHz
Interferer BW	5 MHz
Transmit EIRP	600 w
Log transmit EIRP	57.78151 dBm
Path length, R	10 km
log R	1
Path loss, Erceg model	-156.667 dB
Receive signal power	-98.8852 dBm
User antenna gain	0 dBi
Line loss	-1 dB
Recd. Interference density	-196.875 dBW/Hz
Typical self interference density	-193 dBW/Hz
Typical self interference plus thermal noise density	-192.485 dBW/Hz
Allowable % degradation due to external interference	3%
Allowable external interf. (for 3% degradation of self-interf.plus noise)	-192.357
Total interference and noise density	-191.137 dBW/Hz
Actual degradation in self-interf. plus noise	36%

Table 2: Interference from BRS user equipment into Globalstar

Link budget for BRS user interfering w. Globalstar

Frequency	2500 MHz
Interferer BW	5 MHz
Transmit EIRP	2 w
Log transmit EIRP	33.0103 dBm
Path length, R	4 km
log R	0.60206
Path loss, Erceg model	-142.076 dB
Receive signal power	-109.065 dBm
User antenna gain	0 dBi
Line loss	-1 dB
Recd. Interference density	-207.055 dBW/Hz
Typical self interference density	-193 dBW/Hz
Typical self interference plus thermal noise density	-192.485 dBW/Hz
Allowable % degradation due to external interference	3%
Allowable external interf. (for 3% degradation of self-interf.plus noise)	-192.357
Total interference and noise density	-192.336 dBW/Hz
Actual degradation in self-interf. plus noise	3%

2. Coordination Issues Between Globalstar and Iridium

The Commission noted (L-Band Order, ¶¶ 28-29) that Globalstar and Iridium have already shared CDMA L-band Channels 8 and 9 pursuant to Iridium's Special Temporary Authority ("STA") for service in the Middle East. In point of fact, Globalstar voluntarily vacated Channels 8 and 9 in the Middle East while Iridium had its STA. Sharing under the STA was possible only because neither system is operating at full capacity. In the Middle East, where Iridium had high usage, band segmentation was used to coordinate. In areas where Iridium's usage was low, band segmentation was not necessary because the signals from Iridium's user terminals are sufficiently dispersed and transmitted at sufficiently low cumulative power to avoid causing interference.

While Globalstar is not sure whether other limitations in Iridium's network will allow it to reach the spectral occupancy limit assumed in herein, at a certain level of usage, Iridium transmissions will cause significant interference to Globalstar. Specifically, if Iridium is at capacity and every carrier frequency available to it in a 1.23 MHz Globalstar channel is being used, and assuming that three Iridium beams on average fall into one Globalstar beam, then 88 Iridium carriers are operating in one Globalstar channel. As shown in Table 3, if each Iridium carrier is transmitting at 3 dBW, then the aggregate will cause Globalstar's self-interference and thermal noise density to increase by 15% which is well above the acceptable limit for external interference of 3%.

Similarly Table 4 shows that as Globalstar capacity increases to the point where 40 users are operating in every L-band channel, the Globalstar system will cause interference to Iridium users in the same channel. If Iridium needs a C/I of 18 dB to operate, the Globalstar interference causes it to have a C/I of 8.7 dB, which is likely to be unacceptable to Iridium users.

Table 3: Co-frequency interference from Iridium to Globalstar if both systems are at capacity

Iridium interference into Globalstar

Frequency	1618 MHz
Number of Iridium beams per Globalstar beam	3
Number of Iridium carriers in 1.23 MHz at capacity	88.55291577
Average Iridium transmit power per carrier	3 dBW
Typical range at 40 deg. Elev.	1952 km
Path loss	-162.430937 dB
Interf. density per beam from Iridium users rcvd at Globalstar sat. input	-200.857959 dBW/Hz

At Globalstar satellite

Rcv antenna gain	16 dB
Typical self interference density	-193 dBW/Hz
Typical self interference plus thermal noise density	-192.485031 dBW/Hz
Allowable % degradation due to external interference	3%
Allowable external interf. (for 3% degradation of self-interf. plus noise)	-192.356658
Total interference and noise density	-191.895278 dBW/Hz
Actual degradation in self-interf. plus noise	15%

Table 4: Globalstar co-frequency interference into Iridium operating at capacity with 40 Globalstar users per 1.23 MHz

Globalstar interference into Iridium

Frequency	1618 MHz
Signal BW	41.67 kHz
Assumed number of Globalstar carriers per 1.23 MHz per beam	40
Average Globalstar transmit power per carrier	-10 dBW
Typical range at 40 deg. Elev.	1076.7751 km
Path loss	-157.26384 dB
Typical Iridium user EIRP	0 dBW

At Iridium satellite

Rcvd carrier power	-157.26384 dBW
Interf. density from Globalstar users rcvd at Iridium sat. input	-212.14229 dBW/Hz
Rcvd Globalstar interf. power in signal BW	-165.94406 dBW
Desired C/I	18 dB
Actual C/I	8.6802162 dB

Engineering Certification

I hereby certify under penalty of perjury that I am the technically qualified person responsible for preparation of the engineering information contained in the foregoing "Technical Appendix"; that I am familiar with the relevant sections of the FCC's Rules, the rules adopted and proposals set forth in the "Report and Order, Fourth Report and Order, and Further Notice of Proposed Rulemaking" (FCC 04-134) in IB Docket No. 02-364 and ET Docket No. 00-258, and the information contained in the foregoing Technical Appendix; and that information in the Technical Appendix is true and correct to the best of my knowledge and belief.

Signed this 7th day of September 2004.

A handwritten signature in black ink, appearing to read "Paul A. Monte", written over a horizontal line.

Paul A. Monte
Director, Systems & Regulatory Engineering
Globalstar LLC

CERTIFICATE OF SERVICE

I, William D. Wallace, hereby certify that I have on this 8th day of September, 2004, caused to be served true and correct copies of the foregoing "Petition for Reconsideration of Globalstar LLC" upon the following persons via hand delivery:

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